BROOKHAVEN NATIONAL LABORATORY

Innovating Energy Storage at Brookhaven National Lab

Mission

Enable development of safe and cost-effective batteries with partners across both the academic and industrial sectors.

Sponsor

U.S Department of Energy
Office of Science

Facilities

Facilities include humidity-controlled:

- Support lab
  work area: 936 ft²
  max dew point: 0.5 °F
- Dry lab
  work area: 724 ft²
  max dew point: -40 °F

Instrumentation includes:

- Multi-channel battery tester
- Multi-potentiostats w/ EIS
- Isothermal microcalorimeter
- XRD, SEM, TGA/DSC, ICP-OES
- Pouch cell fabrication line

Location

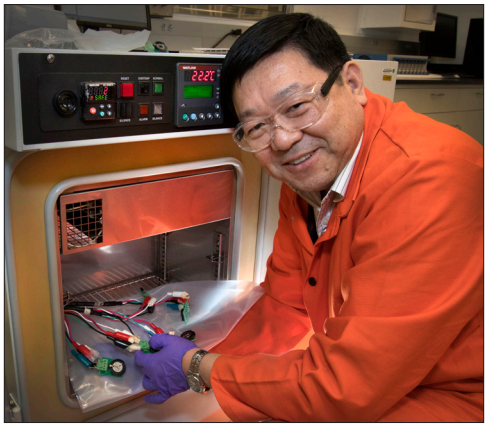
Brookhaven National Laboratory
Upton, NY, USA

Interdisciplinary Science Building

The Interdisciplinary Science Building (ISB)—Brookhaven Lab's center for energy research—provides customized laboratories for multidisciplinary research teams seeking to solve the nation's most pressing energy and environmental challenges. Our scientists undertake fundamental and applied studies to understand, engineer, and optimize materials with the goal of developing breakthrough technologies for batteries, biofuels, solar panels, and more.

ISB features a humidity-controlled dryroom facility where researchers can fabricate and test prototype batteries including coin- and pouch-type cells. Inside the dryroom, pouch cell assembly machines for high precision, high quality, and high capacity batteries include an aluminum laminated forming machine, electrode punching tool, ultrasonic welder, three-side heat sealer, and a vacuum filling machine with heat sealer.

ISB dryroom facilities are accessible for use by industry at a moderate rate. The Lab also offers non-disclosure and material transfer agreements available to protect proprietary or confidential information, or transfer materials for a specific defined purpose and limited duration.resources. Brookhaven cannot provide direct funds to the participant.and technology development with Brookhaven Lab. Research collaborations involving the laboratory can greatly strengthen small business innovative research (SBIR), small business technology transfer (STTR) proposals, and other federal or state funded programs.



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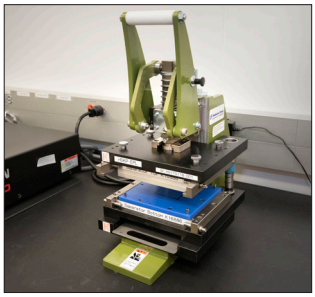
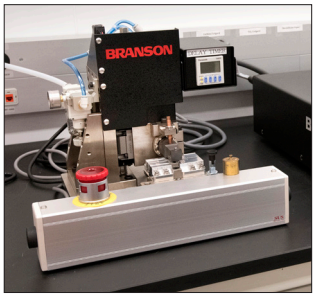
Pouch Cell Assembly at ISB

Researchers at ISB can create prototype batteries of multiple chemistries (Li-ion, Li/S, Na-ion, solid state, and more) in a dryroom environment, and prepare these materials for further characterization at the Lab's Center for Functional Nanomaterials (CFN) or through operando-based measurements at the Lab's National Synchrotron Light Source II (NSLS-II). Our mission is to share our facilities, capabilities, and expertise with both academic researchers and the industrial sector to advance understanding of the chemical processes occurring inside batteries and how to apply that knowledge to commercial systems for smaller, cheaper, lighter, safer, and more efficient alternatives.

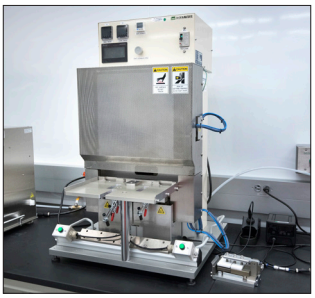
Pouch forming machine



Electrode punch

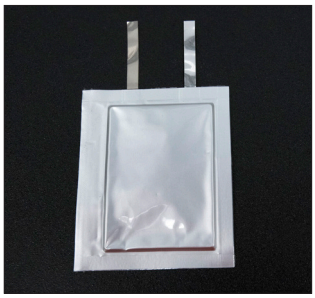


Ultrasonic welder



Three-sided sealer

Electrolyte fill/final seal machine



Fabricated pouch cell

Advanced Facilities for User Nanoscience at the Center for Functional Nanomaterials

ISB is located next to the CFN facility and its extensive materials characterization capabilities, which include electron microscopy, x-ray nanoscience instruments, nanofabrication, advanced optical spectroscopy & microscopy, nanomaterial synthesis & characterization, proximal probes, and theory, data analytics, and computation.

Center for Functional Nanomaterials

Operando Characterization at the National Synchrotron Light Source II (NSLS-II)

This world-class light source opened in 2015 and is enabling its growing user community to study materials with nanoscale resolution and exquisite sensitivity by providing cutting-edge capabilities for X-ray imaging and high-energy resolution analysis. ISB scientists have had success running operando experiments on pouch cells at NSLS-II beamlines.

National Synchrotron Light Source II

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Webpages

Brookhaven Lab
www.bnl.gov

CFN
www.bnl.gov/cfn

NSLS-II
www.bnl.gov/ps

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Energy. Innovation. Solutions.

NYSTAR
Empire State Development
Division of Science, Technology & Innovation

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